

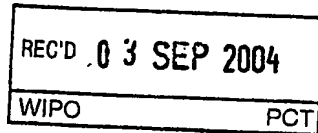
( 1 2. 08. 04 )



INVESTOR IN PEOPLE



The Patent Office  
Concept House  
Cardiff Road  
Newport  
South Wales  
NP10 8QQ



I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

In accordance with the Patents (Companies Re-registration) Rules 1982, if a company named in this certificate and any accompanying documents has re-registered under the Companies Act 1980 with the same name as that with which it was registered immediately before re-registration save for the substitution as, or inclusion as, the last part of the name of the words "public limited company" or their equivalents in Welsh, references to the name of the company in this certificate and any accompanying documents shall be treated as references to the name with which it is so re-registered.

In accordance with the rules, the words "public limited company" may be replaced by p.l.c., plc, P.L.C. or PLC.

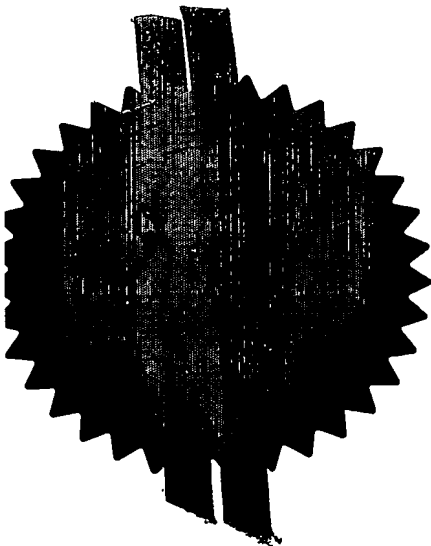
Re-registration under the Companies Act does not constitute a new legal entity but merely subjects the company to certain additional company law rules.

Signed

Dated 4 June 2004

**PRIORITY DOCUMENT**  
SUBMITTED OR TRANSMITTED IN  
COMPLIANCE WITH  
RULE 17.1(a) OR (b)

Best Available Copy



21/08/03 14:22 FAX 01293 815060  
 21/08/03 14:22 FAX 01293 815060  
 21/08/03 14:22 FAX 01293 815060

Patents Form 1/77

THE PATENT OFFICE  
PEPatents Act 1977  
(Rule 16)

21 AUG 2003

RECEIVED BY FAX

The  
Patent  
Office

1/77

**Request for grant of a patent**

(See notes on the back of this form. You can  
 also get an explanatory leaflet from the Patent  
 Office to help you fill in this form)

The Patent Office

21 AUG 2003

Cardiff Road  
 Newport  
 Gwent NP10 8QQ

1. Your reference PHGB030141GBQ
2. Patent application number  
(The Patent Office will fill in this part) 0319670.6
3. Full name, address and postcode of the or of  
each applicant (*underline all surnames*) KONINKLIJKE PHILIPS ELECTRONICS N.V.  
GROENEWOUDSEWEG 1  
5621 BA EINDHOVEN  
THE NETHERLANDS  
07419294001 ✓  

Patents ADP Number (*if you know it*)

If the applicant is a corporate body, give the  
country/state of its incorporation THE NETHERLANDS
4. Title of the invention WIRELESS TRANSMISSION CONTROL
5. Name of your agent (*if you have one*)  

"Address for service" in the United Kingdom  
to which all correspondence should be sent  
(including the postcode) Philips Intellectual Property & Standards  
Cross Oak Lane  
Redhill  
Surrey RH1 5HA

Patents ADP number (*if you know it*) 08359655001 ✓
6. If you are declaring priority from one or more  
earlier patent applications, give the country  
and the date of filing of the or of each of these  
earlier applications and (*if you know it*) the or  
each application number
 

	Country	Priority Application number	Date of filing
7. If this application is divided or otherwise  
derived from an earlier UK application, give  
the number and the filing date of the earlier  
application
 

	Number of earlier application	Date of filing (day/month/year)
8. Is a statement of inventorship and of right to  
grant of a patent required in support of this  
request? (*Answer "Yes" if:* YES
  - a) any applicant named in part 3 is not an inventor, or
  - b) there is an inventor who is not named as an  
applicant, or
  - c) any named applicant is a corporate body.  
See note (d))

Patents form 1

## Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form.

Do not count copies of the same document.

## Continuation sheets of this form

Description	5
Claims(s)	2
Abstract	1
Drawings	2

10. If you are also filing any of the following, state how many against each item:

## Priority Documents

Translations of priority documents

Statement of inventorship and right

to grant of a patent (*Patents Form 7/77*)

Request for preliminary examination and

search (*Patents Form 9/77*)

Request for substantive examination

(*Patents Form 10/77*)

Any other documents

(*Please specify*)

11. I/We request the grant of a patent on the basis of this application.

Signature

*P J Mabeey*

Date

*21/8/03*

12. Name and daytime telephone number of person to contact in the United Kingdom

01293 815576

P J MABEY

## Warning

After an application for a patent has been filed, the Comptroller of the Patent Office will consider whether publication or communication of the invention should be prohibited or restricted under Section 22 of the Patents Act 1977. You will be informed if it is necessary to prohibit or restrict your invention in this way. Furthermore, if you live in the United Kingdom, Section 23 of the Patents Act 1977 stops you from applying for a patent abroad without first getting written permission from the Patent Office unless an application has been filed at least 6 weeks beforehand in the United Kingdom for a patent for the same invention and either no direction prohibiting publication or communication has been given, or any such direction has been revoked.

## Notes

- If you need help to fill in this form or you have any questions, please contact the Patent Office on 0645 500505.
- Write your answers in capital letters using black ink or you may type them.
- If there is not enough space for all the relevant details on any part of this form, please continue on a separate sheet of paper and write "see continuation sheet" in the relevant part(s). Any continuation sheet should be attached to this form.
- If you have answered "Yes" *Patents Form 7/77* will need to be filed.
- Once you have filled in the form you must remember to sign and date it.
- For details of the fee and ways to pay please contact the Patent Office.

## DESCRIPTION

## WIRELESS TRANSMISSION CONTROL

5           The invention relates to a method and apparatus for controlling transmission activity of wireless devices, particularly but not exclusively Ultra Wide Band devices.

          Ultra Wide Band (UWB) technology is set to become in the next few  
10   years one of the most important means to transmit wirelessly information at a high data rate. After the FCC First Report and Order of 14th February 2002 for the US region, a new market is open for mobile data devices, a legislation is expected to follow soon also in Europe. Some of the advantages of UWB technology are unlicensed reuse of existing radio spectrum, simpler  
15   transceiver architecture, higher data rates of transmission and an accurate ranging capability.

          One of the major concerns still putting in doubt the success of UWB is its capability to coexist with other services without effecting too much their operation. UWB transmission are in frequency bands already occupied by  
20   other commercial systems, such as cellular systems, microwave links and satellite links, with main frequencies of transmissions forecast to be between 3.1 GHz and 10.6 GHz, but with emissions also in other regions of the spectrum according to the power masks shown in Figure 2.

          Furthermore, steps are required to minimise the power consumption of  
25   UWB chipsets to make them more competitive with other low power wireless solutions, such as Bluetooth. First generation UWB chipsets may consume in the region of 200mW, which is four to five times more than current Bluetooth chipsets.

30           An object of the invention is to enable a reduction of interference and a reduction of power consumption.

According to a first aspect of the invention there is provided a method of controlling wireless transmission by one or more wireless devices, comprising measuring transmission activity level of one or more wireless devices and, in response to the measured transmission activity level complying with a predetermined criterion, controlling the transmission activity of at least one of the wireless devices.

According to a second aspect of the invention there is provided an apparatus for controlling wireless transmission by one or more wireless devices, comprising measurement means for measuring transmission activity level of one or more wireless devices and control means responsive to the measured transmission activity level complying with a predetermined criterion for controlling the transmission activity of at least one of the wireless devices.

Ways of measuring the transmission activity level include measuring the proportion of transmission time over a predetermined period for one or more wireless devices, or measuring an indication of aggregate power transmitted by a plurality of wireless devices averaged over a predetermined period.

Ways of controlling the transmission activity include reducing the transmit power level of one or more of the devices, a special case of which comprises prohibiting transmission by one or more of the devices for a further predetermined time period.

The apparatus for controlling wireless transmission may be integral with a device that it controls. The apparatus may control one or more external devices by wireless communication.

The invention is based on the realisation that for wireless electronic devices that are in active use, and therefore transmit, for only a fraction of the maximum theoretical time, and performing temporal averaging and control is a practical way of controlling interference levels, and also enables power consumption to be reduced. In this specification, the apparatus for controlling the transmission activity is also referred to as an activity factor controller.

The invention will now be described, by way of example only, with reference to the accompanying drawings wherein:

Figure 1 is a block schematic diagram of a cluster of wireless devices;

Figure 2 is a graph showing FCC Report and Order and ETSI draft  
5 spectrum masks for transmissions by UWB communication devices in indoor situations;

Figure 3 is a graph showing simulation results for the aggregate interference effect from UWB to a FWA hot-spot link with different activity factors.

10 Figure 4 is a graph showing simulation results for the aggregate interference effect from UWB to a FWA point-to-point link with different activity factors.

The activity factor controller can be implemented in two different ways:

15 a) Embedding the activity factor controlling functionality into the controlled device (so controlling and controlled functions are living within the same device). The device's microcontroller will simply records the quantity of transmission activity registered in the last period and display the updated remaining time-to-air to the user. An active control checks that a fixed  
20 threshold is not reached within a predefined period. The consequence of reaching some intermediate levels (between zero and the maximum allowed usage) might be similar to what already shown today by battery control techniques. As an example, after reaching 50% of the maximum power allowed in the day, the activity factor controller might intervene automatically  
25 reducing the power of transmission (and consequently the interference to outside services). In data transfers mechanisms this might mean a slightly longer wait for file transfers. In sensing applications, a lower refresh rate of the system, in video transmission systems, might mean for example the switch to a lower resolution mode if the actual quality of service (QoS) cannot be  
30 maintained with the new (reduced) allowed power. In the case of the

transmission reaching the 100% of its allowed daily limit, the activity factor controller will switch off completely the UWB radio transmitter.

b) This temporal average usage control can also be implemented via external master units checking and enabling the total traffic in a home. This activity factor control unit might base its decision on priorities assigned by the user on his/her daily needs and changeable up to the maximum level allowed for each class of services. In such an environment the activity factor controller would dynamically calculate the aggregate power emitted by the pool of devices it is controlling and adjust them to make sure they do not exceed the preset limits, for example switching off or reducing the quality of service of lower-priority radio devices first. This activity factor controller unit might also receive special updates and have its limits sets in base to the area where it is used. In fact, while the aggregate interference power might be of concern for a large building which sits in close proximity to a FWA microwave link, it should have no noticeable influence on small homes or countryside places where only a small number of devices are used.

The radio-emission limits might also be automatically updated or set into the activity factor controller also based on the coordinates of its location (entered by the user or automatically retrieved via a GPS or other location mechanism device that can provide this information to the controller). In an ideal and perfectly connected situation, these updates might also arrive from a central database UWB radio controller station, which monitors in real time the effects of interference in key areas that are vital and need suitable protection, as vital microwave relay links in disaster areas (to keep the communications active and disable the UWB devices with low priorities).

Referring to a Figure 1, there is illustrated a cluster of UWB wireless devices 10 and an activity factor controller 20 comprising a measurement means (M) 22 for measuring transmission activity level and a control means (C) 24 for controlling transmission activity. Optionally the activity factor controller 20 comprises a location means (L) 26 for determining the location of the activity factor controller 20.

Simulation results illustrating the reduction in interference power obtainable by reducing the activity level in accordance with the invention are illustrated in Figure 3 and 4.

5 In the present specification and claims the word "a" or "an" preceding an element does not exclude the presence of a plurality of such elements. Further, the word "comprising" does not exclude the presence of other elements or steps than those listed.

The inclusion of reference signs in parentheses in the claims is intended to aid understanding and is not intended to be limiting.

10 From reading the present disclosure, other modifications will be apparent to persons skilled in the art. Such modifications may involve other features which are already known in the art of UWB and the art of wireless communications and which may be used instead of or in addition to features already described herein.

15



## CLAIMS

1. A method of controlling wireless transmission by one or more wireless devices (10), comprising measuring transmission activity level of one  
5 or more wireless devices (10) and, in response to the measured transmission activity level complying with a predetermined criterion, controlling the transmission activity of at least one of the wireless devices (10).
2. A method of controlling wireless transmission as claimed in claim  
10 1, wherein measuring the transmission activity level comprises measuring the proportion of transmission time over a predetermined time period
3. A method of controlling wireless transmission as claimed in claim  
15 1, wherein measuring the transmission activity level comprises measuring an indication of aggregate power transmitted by a plurality of the wireless devices (10) averaged over a predetermined time period
4. A method of controlling wireless transmission as claimed in any  
of claims 1 to 3, wherein controlling the transmission activity comprises  
20 reducing the transmit power level of one or more of the devices (10).
5. A method of controlling wireless transmission as claimed in claim  
4, wherein the reduction in power level comprises prohibiting transmission by one or more of the devices for a further predetermined time period.
- 25 6. A method of controlling wireless transmission as claimed in any of claims 1 to 5, wherein the predetermined criterion is location dependent.
7. Apparatus (20) for controlling wireless transmission by one or  
30 more wireless devices, comprising measurement means (22) for measuring transmission activity level of one or more wireless devices (10) and control

means (24) responsive to the measured transmission activity level complying with a predetermined criterion for controlling the transmission activity of at least one of the wireless devices (10).

5           8.     Apparatus as claimed in claim 7, wherein the measurement means (22) is adapted for measuring the transmission activity level as the proportion of transmission time over a predetermined time period

10           9.     Apparatus as claimed in claim 7, wherein the measurement means (22) is adapted for measuring the transmission activity level as an indication of aggregate power transmitted by a plurality of the wireless devices (10) averaged over a predetermined time period

15           10.    Apparatus as claimed in any of claims 7 to 9, wherein the control means (24) is adapted to control the transmission activity by reducing the transmit power level of one or more of the devices (10).

20           11.    Apparatus as claimed in claim 10, wherein the control means (24) is adapted to control the transmission activity by prohibiting transmission by one or more of the devices (10) for a further predetermined time period.

25           12.    Apparatus as claimed in any of claims 7 to 11, wherein the control means (24) is adapted to control the transmission activity by transmitting a control command to one or more of the devices (10).

            13.    Apparatus as claimed in any of claims 7 to 13, wherein the measurement means (22) is adapted vary the predetermined criterion in response to data indicative of the location of the apparatus.

30           16.    Apparatus as claimed in claim 15, comprising location means (26) adapted to generate the data indicative of the location of the apparatus.

## ABSTRACT

## WIRELESS TRANSMISSION CONTROL

- 5 Wireless transmission by one or more wireless devices (10) is controlled by measuring transmission activity level of one or more of the wireless devices (10) and, in response to the measured transmission activity level complying with a predetermined criterion, controlling the transmission activity of at least one of the wireless devices (10).

10

(Figure 1)

1/2

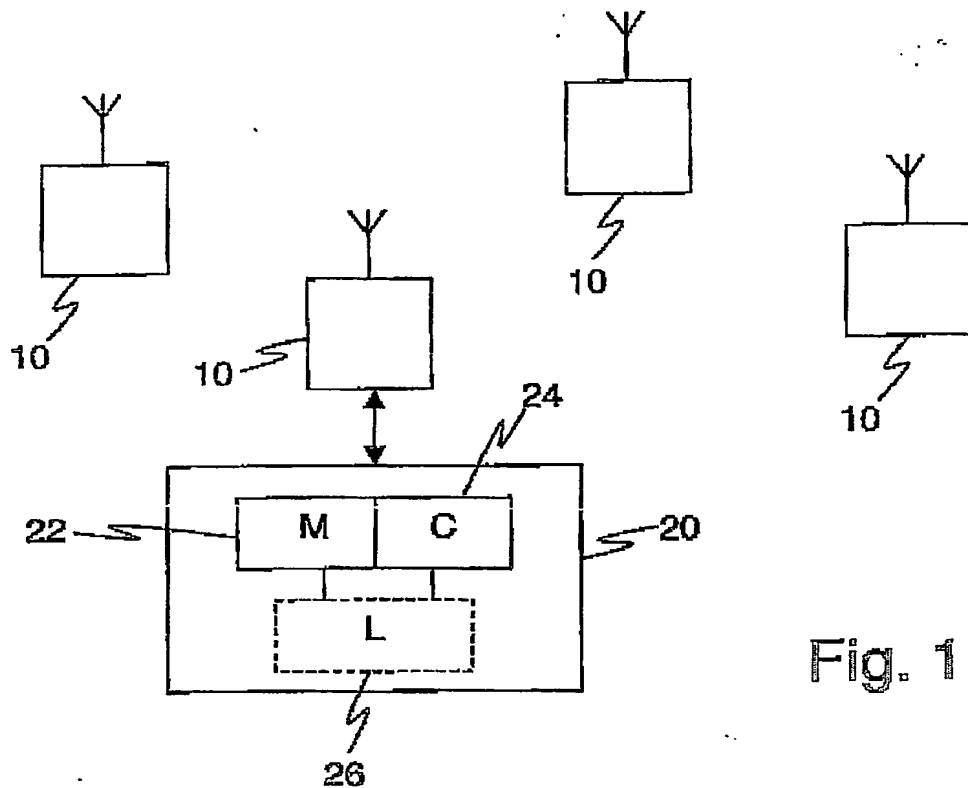


Fig. 1

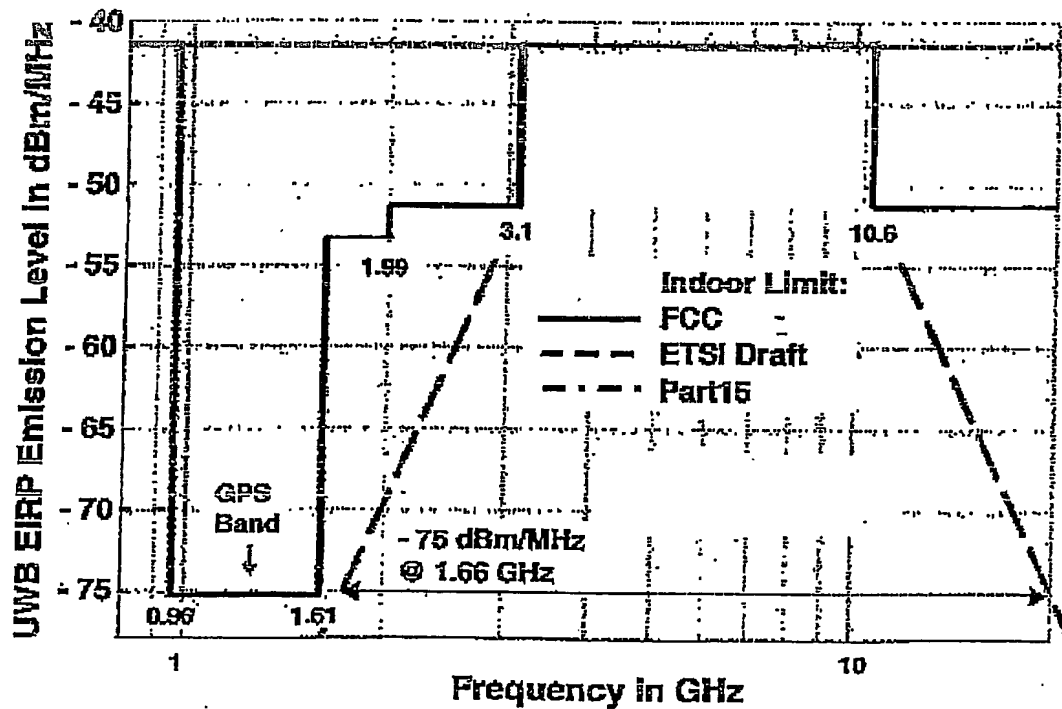


Fig. 2

2/2

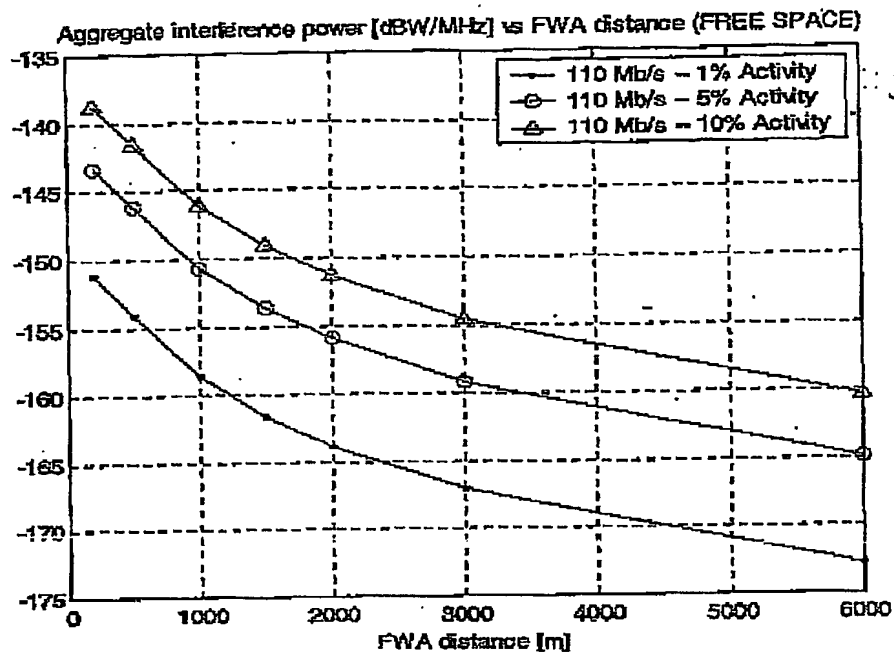


Figure 3: Aggregate interference effect from UWB to a FWA hot-spot link with different activity factors. The lower the activity factor, the lower the interference.

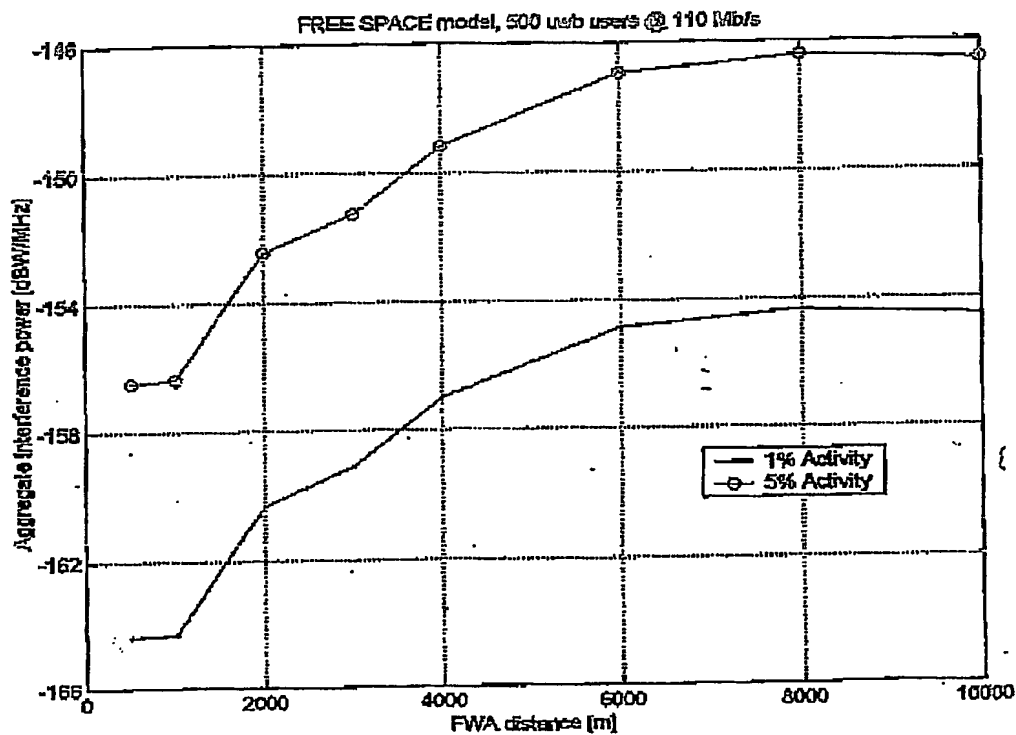


Figure 4: Aggregate interference effect from UWB to a FWA Point-to-point link with different activity factors. The lower the activity factor, the lower the interference.

**This Page is Inserted by IFW Indexing and Scanning  
Operations and is not part of the Official Record**

**BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ **BLACK BORDERS**
- ☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- ☐ **FADED TEXT OR DRAWING**
- ☐ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- ☐ **SKEWED/SLANTED IMAGES**
- ☐ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- ☐ **GRAY SCALE DOCUMENTS**
- ☒ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- ☐ **OTHER:** \_\_\_\_\_

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.**